week of the walk test. Linear correlations were performed between the walk tests and the exercise, hemodynamic, functional and echocardiographic parameters, and correlation coefficients (r values) were derived. The walk test results were then corrected for patient height, weight and body surface area. The corrected walk test results were then correlated against the other investigations. 80 patients, mean age 55 ± 10 years and left ventricular ejection fraction (LVEF) 0.22 ± 0.07 ejection fraction units, performed a total of 88 × 6-min and 49 × 12-min walk tests. The 6-min walk test correlated best with the VO_2peak (r = 0.62). The 12-min walk test correlated poorly (r = 0.27). There was no significant relation between the walk tests or VO_2peak with NYHA functional class, LVEF, cardiac index, pulmonary capillary wedge pressure, pulmonary artery pressure or echocardiographic dimensions (no r value > 0.50). There was no correlation between the distance walked on 6- and 12-min walk tests with patient height (r = 0.34 and 0.09 for 6- and 12-min walks, respectively), age (r = −0.35 and −0.07), weight (r = 0.2 and 0.11), or hemoglobin (r = 0.11 and 0.14). When corrected for height, the 6- and 12-min walk tests correlated similarly against the VO_2peak (r = 0.56 and 0.21, respectively). The correlation against VO_2peak when corrected for weight (r = 0.41 and 0.27) and body surface area (r = 0.51 and 0.26) was similar. The walk tests are simple, reliable and independently assess functional exercise capacity in advanced heart failure. They do not require correction for height or weight and are not significantly influenced by these factors.

966-69 Normal Variations and Determinant Factors of Six-Minute Walk Test

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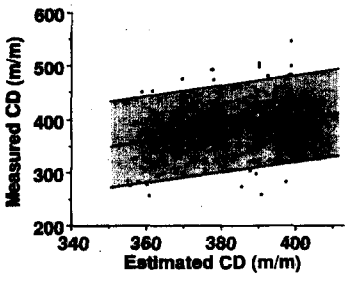
Six-minute walk test is used as a simple index of the aerobic exercise capacity in cardiac patients. However, little is known about the normal value. We examined normal variations of six-minute walk test. Furthermore, we clarified its determinant factors. We studied 396 healthy volunteers in Osaka University, 300 males and 96 females, ranging in age from 18 to 63 years. The unencouraged 6-minute walk test was performed in a 15 m unobstructed corridor. Subjects were instructed to walk as fast as they could. Distance walked during 6 minutes was significantly correlated with height (p = 0.0002). Therefore, we obtained the corrected distance [CD; distance/height (m/m)] and determined predictors of CD using multivariate regression. Variables analyzed and their p values were as follows; age (< 0.0001), weight (0.001), sex (0.28), habits of exercise (0.20), smoking (0.59), drinking (0.34), methods of attending (0.77), sedentary occupation (0.08). Thus, only age and weight were significant predictors. The multivariate equation for predicting CD was as follows;

$$CD\ (m/m) = 454 - 0.87 \times age\ (years) - 0.66 \times weight\ (kg) \quad (1)$$



The relationship between estimated and measured values of CD is shown in Fig. The shaded area represents normal range in which differences between estimated and measured values are within ± 2SD (82 m/m). We conclude that height, weight and age should be taken into account when we interpret the data of 6-minute walk test.

966-70 Diagnostic Dobutamine Stress Testing is Dependent on Stage Duration

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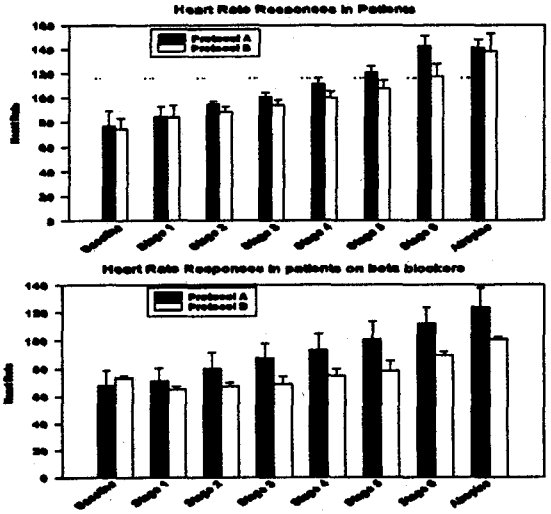
Dobutamine stress testing is an important diagnostic modality in patients who are unable to exercise due to a variety of reasons. Inspite of its popularity the optimal infusion protocol for dobutamine has not been established. In addition since dobutamine has a half-life of 60–120 seconds and an onset of action within 1–2 minutes the presently prevalent 3-minute stages may be of insufficient duration to obtain the desired inotropic or chronotropic effects. 46 patients referred for dobutamine stress testing were randomised to either 5 minute infusion stages (Protocol A) or 3 minute infusion stages (Protocol B) of dobutamine and the mean heart rate response noted at the end of each stage. The patient populations in both groups were similar in all respects except that significantly more patients on protocol A were on Beta blockers. While the rate responses at the end of the first case were not significantly different in both protocols; protocol A produced a significantly higher rate response (p < 0.05) in patients from the end of the second stage onwards. In addition protocol A produced significantly higher rate response (p < 0.05) in patients on beta blockers as compared to the conventional protocol B. There was also a significant difference in the rate response of patients on beta blockers when compared to patients not on beta blockers (p < 0.05).



Thus 5 minute stages of dobutamine stress testing may be of greater utility in achieving target heart rate responses in patients referred for dobutamine stress, especially those on beta blockers.

966-71 ST-Segment Depression Does Not Predict Ischemia In Women Undergoing Dipyridamole Infusion

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Among women, ST-segment depression (STdpr) during exercise testing is considered an unreliable marker of ischemia. With dipyridamole (DP) infusion the significance of STdpr among women is unknown. *Methods:* We studied 487 consecutive patients (pts) having DP perfusion imaging (0.57 mg/kg over 4 min with sestamibi injection at 6 min) for development of ≥1 mm horizontal or downsloping STdpr. An additional 1 mm STdpr was required if resting STdpr was present. Ischemia was defined as any new perfusion defect compared to the resting scan. Excluded were 31 pts with LBBB or paced rhythm. *Results:* Age, antianginal use, and digoxin use were similar in women and men. STdpr occurred in 35/258 (14%) women versus 23/198 (12%) men (p = NS). Reversible perfusion defects were more frequent in men with STdpr (78% vs 45%) and involved more vascular territories (all p = 0.01). At baseline, women with STdpr had higher SBP and rate pressure product (RPP) than men with STdpr and women without STdpr (all p < 0.02). At peak effect, women with STdpr had higher heart rate (HR) and HR change than men with STdpr and women without STdpr (p < 0.005). RPP remained elevated in women with STdpr compared to men with and women without ST dpr (p < 0.001). Delta RPP was also higher among women with STdpr versus men (p = 0.03). When analyzed with respect to ischemia, no significant hemodynamic alterations occur among women with STdpr. *Conclusions:* (1) The frequency of STdpr with DP is equal in women and men. (2) Reversible perfusion scan defects are much more frequent and extensive in men as compared to women with DP-induced STdpr. (3) Hemodynamic alterations induced by DP do not predict ischemia in women with STdpr. (4) DP-induced STdpr is not a reliable marker of myocardial ischemia in women.

966-72 Sex Differences in Noninvasive Diagnosis of Multivessel Coronary Artery Disease

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Aim of the present study was to assess the diagnostic power of three noninvasive main tests for the detection of multivessel coronary artery disease (mCAD) in a sample of women compared with an age matched sample of men. *Methods:* The study group consisted of 200 patients (pts). Group 1: